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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

MARKS, JACOB B

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

07/20/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/585,940	<b>Applicant(s)</b> YAMADA ET AL.	
	<b>Examiner</b> JACOB MARKS	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 7-13-06.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 17-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 12-16 is/are rejected.
- 7) ☒ Claim(s) 9-11 and 15 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7-13-06</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Election/Restrictions***

Claims 1-22 are pending. Claims 17-22 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election of Group I claims 1-16 was made **without** traverse in the reply filed on 4-30-09.

### ***Claim Objections***

Claim 15 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 15 recites the limitation that the aluminum diffusion coating is used instead of the plating treatment of claim 14. Therefore, claim 15 has a different scope from that of its parent claim 14.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

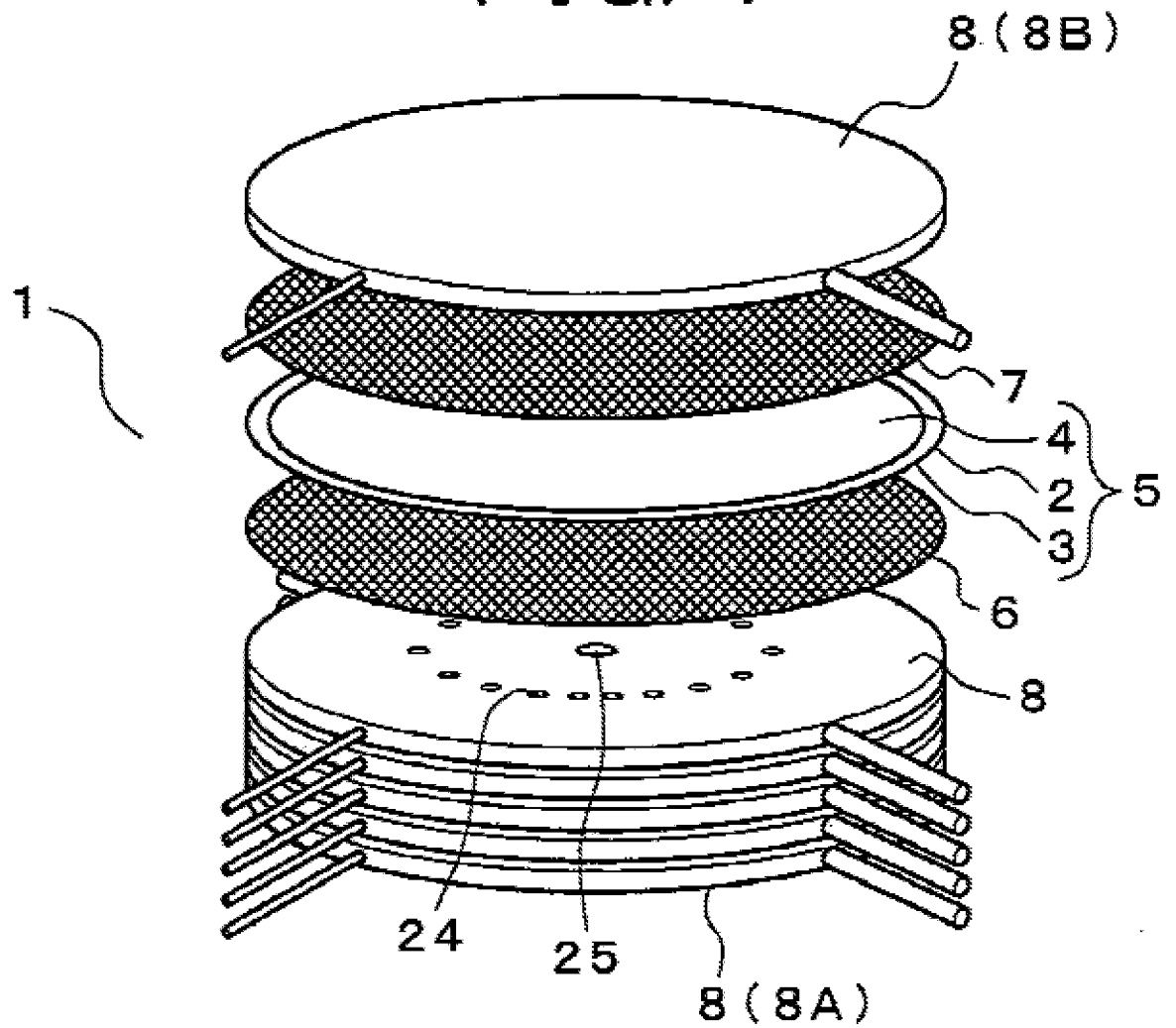
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 5, 7, and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Komada et al. (WO 03075384, for translation see US Pat. Pub. 2005/0221161).

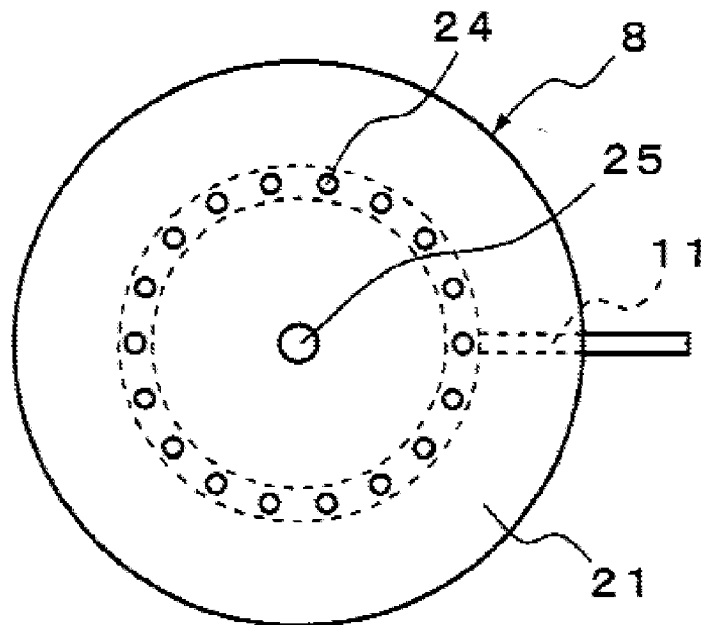
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Regarding claims 1 and 16, Komada et al. teach a solid oxide fuel cell stack 1 with current collectors 6 and 7, an air electrode layer 4 (power generation cell), and separators 8 that are arranged in alternate lamination (see fig. 1) comprising gas discharge openings 24 (ports for discharging reactive gas) on electrode layers (abstract, par. 68). Komada et al. further disclose that there are multiple gas discharge openings 24 (ports) wherein gas is supplied to whole areas of electrode layers (abstract). The gas discharge openings 24 (ports) would inherently discharge like a shower toward the current collectors 6 and 7 and the air electrode layer 4 (power generation cell) (abstract, par. 60). Therefore, Komada et al. teaches all of the positively recited structure of the claimed apparatus.

FIG. 1

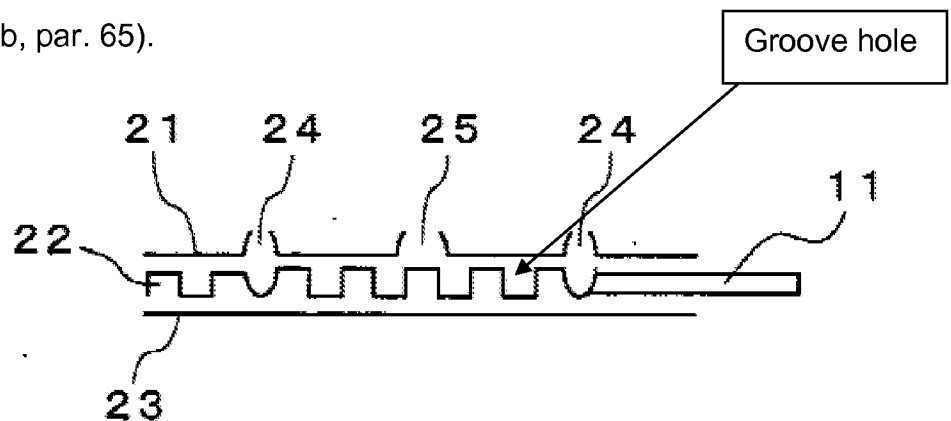


**FIG. 2a**



Regarding claim 2, Komada et al. disclose that separator 8 is hollow in order to function as the gas flow path where the gas is discharged from the gas discharge openings 24 (ports) (fig. 2b, par. 65).

**FIG. 2b**



Regarding claim 3, Komada et al. disclose that fuel gas is introduced to separator 8 through fuel gas passage 11 (gas inlet), wherein the gas discharge ports are arranged along multiple virtual lines from the gas passage 11 (gas inlet) (see fig. 2b, fig. 2a, par. 64).

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Regarding claim 5, Komada et al. disclose that the fuel gas is introduced to separator 8 through fuel gas passage 11 (gas inlet), where the fuel gas then flows through gas discharge openings 24 (ports), which are arranged along multiple virtual lines radially extended from the center part of the layer surface (see fig.1, 2a, 2b, par. 64, 65).

Regarding claim 7, Komada et al. disclose that separator 8 is hollow in order to function as the gas flow path where the gas is discharged from the gas discharge openings 24 (ports) (fig. 2b, par. 65). Such a hollow gas flow path would act as an inner flow passage for guiding reactive gas to the gas discharge ports.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

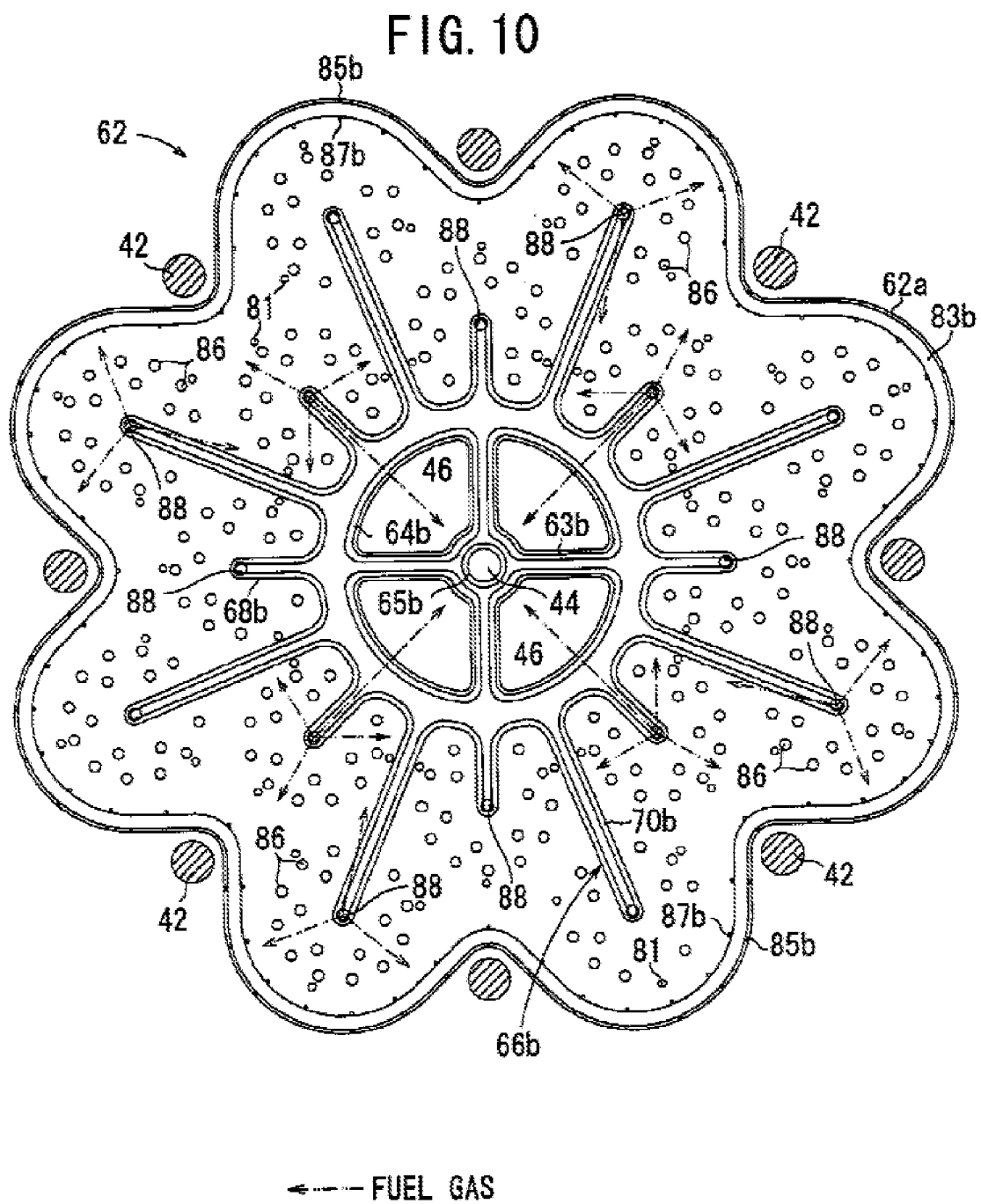
The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komada et al. in view of Tsunoda (US Pat. Pub. 2004/0043270).

Regarding claims 4 and 6, Komada et al. disclose that fuel gas is introduced to the hollow part of separator 8 through fuel gas passage 11 (gas inlet) (fig. 2b, par. 64, 65). Komada et al. disclose that the fuel gas then flows through gas discharge openings 24 (ports), which are arranged along multiple virtual lines radially extended from the center part of the layer surface (see fig.1, 2a, 2b, par. 64, 65). Komada et al. does not disclose that the gas discharge ports are arranged along multiple concentric circles centered at the gas inlet. However, Tsunoda discloses a separator plate wherein fuel gas inlets 88 (gas discharge ports) are arranged along multiple concentric circles that are centered around gas supply hole 44 (gas inlet) (par. 44, 56, fig. 10). One of ordinary skill in the art would recognize that using gas discharge ports along two concentric circles, as taught in Tsunoda, instead of along just one circle, as taught in Komada et al., would cover more surface area of the electrolyte thereby making the fuel cell more efficient. Therefore, it would have been obvious to one of ordinary skill in the art to use the gas discharge ports on multiple concentric circles as taught in Tsunoda on the separator of taught in Komada et al. in order to make the fuel cell more efficient.





Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Komada et al., in view of Mottola et al. (US Pat. No. 6,179,816).

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Regarding claim 8, Komada et al. does not disclose that the gas discharge ports become diametrically larger downstream. However, Mottola et al. disclose that the fluid distribution in a catheter is made more uniform by making outlet holes larger farther down stream (abstract). Therefore, it would have been obvious to one of ordinary skill in the art to make gas discharge ports of Komada et al. diametrically larger at points further downstream in order to make the fluid distribution more uniform.

Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komada et al., in view of Allen (US Pat. No. 6,670,069).

Regarding claims 12 and 13, Komada does not disclose that the hollow part or the wall surface of the inner flow passage is subjected to an aluminum diffusion coating treatment. However, Allen discloses that a separator plate may receive a coating of diffused aluminum in order to prevent corrosion (col. 8 lines 35-49). Therefore, it would have been obvious to one of ordinary skill in the art to make the hollow part and the wall surface of the inner flow passage with a coating of diffused aluminum in order to prevent corrosion.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakata et al. (US Pat. Pub. No. 2001/0028974).

Regarding claim 14, Komada et al. disclose a laminate structure with a hollow interior, wherein the separator 8 is formed with the hollow interior in order to function as the gas flow path where the gas is discharged from the gas discharge openings 24 (ports) (fig. 2b, par. 65; par. 71). The groove hole is depicted by the text box shown on

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fig. 2b, wherein the groove hole is contained on the bottom plate. It is implicit in Komada et al. that the laminated structure is formed by laminating multiple plate shaped members. Komada et al. does not disclose that the base material of the plate-shaped member is made of an iron based alloy or that the base material is plated with silver. However, Nakata et al. disclose that a separator (plate shaped member) may be made of stainless steel (iron based alloy) as a base material, which is further coated with silver (par. 74, 114). Nakata et al. disclose that corrosion can be prevented by using such a material (abstract). Therefore it would have been obvious to one of ordinary skill in the art to use a stainless steel (iron based alloy) as a base material with a coating of silver for the separator (plate shaped member) of Komada et al. in order to prevent corrosion.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Komada et al., in view of Nakata et al. and Allen.

Regarding claim 15, Komada et al. does not disclose that the wall surface or the hollow part is subjected to an aluminum diffusion coating treatment or that the base material for a separator is made from steel. However, Nakata et al. disclose that steel is useful as a base material for a fuel cell separator because of its low cost (par. 6). In addition, Allen discloses that a separator plate may receive a coating of diffused aluminum in order to prevent corrosion (col. 8 lines 35-49). Therefore it would have been obvious to one of ordinary skill in the art to build the separator of Komada et al. out of a base material of steel, because steel is a low cost material, and to further cause

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the separator to receive a coating of diffused aluminum, as taught by Allen, in order to prevent corrosion.

***Allowable Subject Matter***

Claims 9-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 9, the cited prior art neither teaches nor fairly suggests that the inner flow passage has a spiral shape.

Regarding claim 10, the cited prior art neither teaches nor fairly suggests that the inner flow passage has a zigzagged shape.

Regarding claim 11, the cited prior art neither teaches nor fairly suggests that the inner flow passage is formed by multiple flow passage radially branched from the gas inlet, which is in the outer peripheral part of the separator.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JACOB MARKS whose telephone number is (571)270-7873. The examiner can normally be reached on Monday through Friday 7:30-5:00 alt Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on 571-272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jacob Marks/

/Brian J. Sines/

Supervisory Patent Examiner, Art Unit 1795